UT Extension
SP 291-L

Vegetables

Fresh Vegetable Storage for the Homeowner

Alvin D. Rutledge, Professor Emeritus, Plant Sciences

Many vegetables grown in home gardens can be stored fresh, but they must be harvested at the proper maturity and kept at the correct temperature and humidity. In addition, proper ventilation and sanitation must be maintained during storage. Basically, storage is placing harvested vegetables in an environment where the life processes, respiration and water loss, are kept at low levels.

Respiration during Storage

During respiration, sugars and other compounds are broken down within the cells. This releases energy, carbon dioxide, water and heat. The energy is needed by the living cells of the stored product. The carbon dioxide should be removed by adequate ventilation.

Several factors regulate respiration. In general, the higher the temperature, within normal ranges, the faster the respiration rate. Thus, you can see the importance of refrigeration in prolonging the life of harvested vegetables. The presence of soluble sugars in cells also influences the rate of respiration. At 70 degrees F, the respiration rate of sweet corn is 3.6 times as fast as it is at 41 F. Thus, it needs to be cooled immediately after harvest.

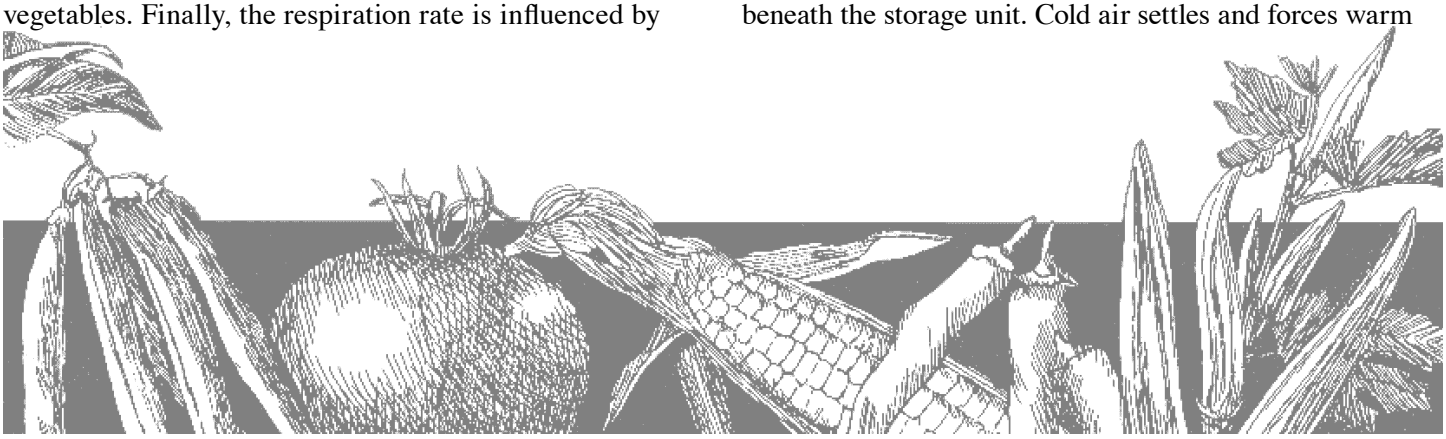
The rate of respiration also varies directly with water content. At a given temperature, succulent plant parts, such as head lettuce, respire more rapidly than non-succulent products, such as sweet or Irish potatoes. Immature vegetables respire more rapidly than mature vegetables. Finally, the respiration rate is influenced by the oxygen level. During respiration, oxygen is absorbed and carbon dioxide is released. Consequently, an airtight area will allow a decrease in oxygen and an increase in carbon dioxide. As a result, the respiration rate gradually decreases. However, if an area is completely airtight and oxygen levels fall too low for the complete combustion of sugars, undesirable compounds are produced that lower vegetable edibility. Therefore, respiration should be held at low levels rather than be stopped completely. For this reason, vegetable and fruit items are often wrapped in perforated plastic containers in supermarkets.

Water Loss during Storage

Water loss in fresh vegetables results in a wilted, dull appearance that reduces eye appeal and freshness. Preventing water loss improves shelf life, appearance and desirability. Water loss in storage is prevented by storing the product at as low a temperature and as high a relative humidity as possible for the product. Proper humidity conditions are discussed in Table 1.

The Refrigerator

Homeowners most commonly store vegetables in a refrigerator. Refrigerators usually maintain a temperature of about 40 degrees F, but temperatures may vary within the storage compartment. In single-door models with a frozen food storage unit, temperatures are generally lowest just beneath the storage unit. Cold air settles and forces warm



air near the vegetable tray upward along the sides. The circulation air is usually of lower humidity and will dry out uncovered vegetables. However, the humidity in the tray can be maintained at a higher level by using moist towels or by an abundance of vegetables.

While many vegetables can be stored well in the refrigerator for a week or longer, you should observe certain storage precautions. For instance, many ripening fruits should not be stored together with vegetables. These fruits give off ethylene gas, which causes yellowing of green vegetables, russet spotting on lettuce, toughening of asparagus spears, sprouting of potatoes and bitterness in carrots. Some commonly used fruits that are high ethylene producers are pears, plums, apples, cantaloupes and peaches.

Storage Requirements of Specific Vegetables

Now that we have outlined the reasons for cool storage of fresh vegetables, specific requirements for several crops are outlined in Table 1. Notice that the ideal storage requirements vary with the specific groups.

Table 1. Grouping Fresh Vegetables According to Their Storage Requirements

Group 1

Keep at 32 to 41 degrees F and 85 to 95 percent relative humidity. Store in the refrigerator crisper and maintain high humidity by keeping the crisper more than half full. Wash and drain well before storage.

Beet greens	Lettuce
Swiss chard	Mustard greens
Collards	Spinach
Green onions	Turnip greens
Kale	

Store the following vegetables in a crisper separate from the above vegetables, in plastic bags or containers in the main compartment of the refrigerator.

Asparagus	Lima beans
Beets	Mushrooms
Broccoli	Peas
Brussel sprouts	Radishes
Cabbage	Rhubarb
Carrots	Sweetcorn (if unhusked, keep close to the freezer compartment)
Cauliflower	Turnips
Celery	

Group 2

Ideally, the following vegetables keep best at 45 to 55 degrees F and 85 to 95 percent relative humidity, due to their sensitivity to chilling injury. Since this is not always possible in most homes, store in the refrigerator no longer than about seven days. Use soon after removing from refrigerator.

Bell peppers	Ripe melons
Hot peppers	Snapbeans
Cucumbers	Summer squash (yellow, zucchini, scallop)

Group 3

Store vegetables in this group in a cool place (50 to 60 degrees F). Lower temperatures may cause chilling injury. Pantries, basements or garages can provide a cool place during most of the year. Non-insulated garages may be too warm in summer and too cold in winter. If you do not have space, store eggplant and okra as discussed for Group 2. Store ripe tomatoes, winter squash (hard rind) and pumpkins, sweet potatoes and potatoes as recommended in Group 4.

Eggplant	Irish potatoes (store in subdued light to prevent greening)
Okra	Sweet potatoes
Ripe tomatoes	

Group 4

Store the following vegetables at room temperature (65 to 70 degrees F) and away from direct sunlight.

Dry garlic	Dry onions (in open mesh container)
Melons	Tomatoes (mature green, partly ripe and ripe)

SP291L-11/05(Rep) 05-0272

Programs in agriculture and natural resources, 4-H youth development, family and consumer sciences, and resource development.
University of Tennessee Institute of Agriculture, U.S. Department of Agriculture and county governments cooperating.
UT Extension provides equal opportunities in programs and employment.